

REMARKS

The Office Action dated May 16, 2008, has been received and carefully noted. The above amendments and the following remarks are being submitted as a full and complete response thereto.

Claims 13 – 23 are pending in the application. Claims 13 – 19 are rejected. Claims 13 and 19 are amended. Claims 20 – 23 have been withdrawn from further consideration in this application. No claim stands allowed. Support for the amendments may be found in the specification as originally filed. Applicants submit that no new matter is added. Applicants respectfully request reconsideration and withdrawal of the rejections.

REJECTIONS UNDER 35 U.S.C. § 103(a)

Claims 13 – 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kajikawa et al. (U.S. Patent No. 4,309,277, hereinafter “Kajikawa”) in view of JP 2000-045061 (hereinafter “JP’061”). Any reapplication of this rejection would be traversed.

Claim 13 claims a nitriding treatment method for performing a nitriding treatment for a workpiece in a heat treatment furnace comprising certain specifically claimed steps. The first step is applying a pulse voltage having a predetermined current density at a frequency of not less than 1 kHz between the heat treatment furnace and the workpiece to start heating the workpiece by means of generated glow discharge. The second step is decreasing the current density of the pulse voltage after a temperature of the workpiece arrives at 350° C, and then heating the workpiece up to a desired nitriding treatment temperature by using a heating element arranged around the

workpiece. In this manner, the nitriding treatment is performed by means of nitrogen ion or nitrogen radical generated by the glow discharge.

The Office Action has clearly mis-characterized Kajikawa as teaching the second step of decreasing the current density after a temperature of the workpiece is in the range of 300° C to 400° C and then heating the workpiece up to a desired nitriding temperature by using a heating element arranged around the workpiece. Simply viewing either of Figures 3(A) and (B) and 4(A) and (B) shows the error of this interpretation. In both sets of Figures and in the description thereof in the Specification, Kajikawa heats the workpiece only by the heating element at the time of start heating. Further, until the workpiece reaches the optimum temperature for nitriding, the power of the heating elements is reduced rather than increased in Kajikawa. Thus, in contrast to what is exactly claimed, Kajikawa reduces the power to the heating element and does not teach or suggest heating the workpiece up to the desired nitriding treating temperature using the heating element as claimed.

Claim 14 further claims the nitriding treatment method wherein the heating effected in the second step is performed such that an amount of heat generated by the heating element is higher than that in the first step.

With respect to Claim 14, the Office Action is clearly mis-interpreting and ignoring the material in Column 5, lines 11 – 15 of Kajikawa. This contrary to what is being claimed.

Claim 15 further claims the nitriding treatment wherein the current density of said pulse voltage is gradually decreased in the second step, while the workpiece is gradually heated up to the nitriding treatment temperature by using the heating element arranged around said workpiece.

With respect to Claim 15, there is no teaching of a gradual decrease of the DC voltage generating the glow discharge, rather, there is clearly a step decrease of major proportions in both Figures 3(B) and 4(B) of Kajikawa.

JP'061 does not appear to cure any of the above noted deficiencies of Kajikawa with respect to any of Claims 13 – 18.

Claim 19 is rejected under 35 U.S.C. §103(a) as being unpatentable over Kajikawa in view of JP'061 as applied to Claim 13 above and further in view of JP 09-079912 (hereinafter "JP'912"). This rejection as well would be traversed if repeated.

Claim 19 further claims the nitriding treatment method wherein the temperature of the workpiece is determined by simultaneously detecting a temperature difference between a radiation temperature and a contact temperature of a dummy workpiece arranged in the heat treatment furnace, detecting a radiation temperature of the workpiece, and correcting the radiation temperature of the workpiece with the temperature difference.

From the drawings of JP'912, it is readily apparent that there is no dummy workpiece present in a heating furnace where the contact temperature of the dummy workpiece is compared with a radiant temperature of the dummy workpiece so as to simultaneously provide a correcting temperature difference for the radiant temperature of the actual workpiece. Rather JP'912 teaches performing an experimental determination of the relationship between emissivity under simulated conditions and actual temperature under that simulation to provide a later used correction factor to an actual rolling mill situation. There is no teaching or suggestion of using an actual dummy workpiece in the same heating furnace at the same time as the treatment is taking place to provide a real time temperature correction as is claimed in Claim 19.

Further, JP'912 does not appear to cure any of the above noted deficiencies of Kajikawa and/or JP'061 with respect to any of Claims 13 – 19.

Consequently, it is strongly contended that clear differences exist between the present invention as claimed in Claims 13 – 19 and the prior art relied upon. It is further contended that these differences are more than sufficient that the present invention as claimed would not have been rendered obvious to a person of ordinary skill in the art viewing those references.

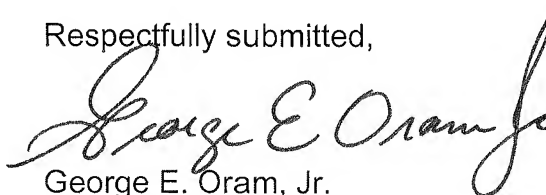
CONCLUSION

Applicants respectfully submit that this application is in condition for allowance and such action is earnestly solicited. If the Examiner believes that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone

number listed below to schedule a personal or telephone interview to discuss any remaining issues.

In the event that this paper is not being timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to Counsel's Deposit Account Number 01-2300, referencing Docket Number 025416-00024.

Respectfully submitted,

A handwritten signature in black ink, reading "George E. Oram, Jr.", with a stylized flourish at the end.

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